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LOGIC · LOGICAL REASONING

## 10. Percentages, Ratios & Unit Calculations

Official PMDC Solved Past Paper Topical Booklet · High-Yield Examination Series

19 Solved Questions

2024 to 2025 Archive

Boards: BUMHS, DUHS, KMU, UHS

Weightage: 3% of MDCAT (6 MCQs)

**Curated by Ibrahim for fellow bees.** Every question in this chapter has been verified against official UHS, NUMS, SZABMU, DUHS, and KMU answer keys. Propolis cognitive autopsies are provided at the end of this booklet to explain core concepts and break down common distractor traps.

**OFFICIAL SOLVED EDITION****Q1.**

BUMHS 2025

If a person earns Rs. 1000 in the first week and their income doubles each week, how much will they earn in the 4th week?

- (A) Rs. 4000
- (B) Rs. 3000
- (C) Rs. 16000
- (D) Rs. 8000

**Q2.**

BUMHS 2025

In a certain university, 25% candidates failed university admission test. Of those who passed the test, 80% got the admission in the university. If 1800 got admission, how many candidates appeared in the test?

- (A) 9000
- (B) 6000
- (C) 3000
- (D) 5000

**Q3.**

KMU 2025

If five boxes of soap weigh 75 kilos and each box when empty weighs three kilos. What is the total weight of the soaps?

- (A) 60 kg
- (B) 15 kg
- (C) 30 kg
- (D) 45 kg

**Q4.**

KMU 2025

A medication dose starts at 100mg and halves each day. What will be the dose on day 4?

- (A) 12.5 mg
- (B) 25 mg
- (C) 30 mg
- (D) 50 mg

**Q5.**

KMU 2025

A library has four books on shelf A, 8 books on shelf B. Some books are removed from shelf B such that both shelves now have exactly the same number of books. How many books were removed from Shelf B?

- (A) 2 books
- (B) 3 books
- (C) 4 books
- (D) 6 books

**Q6.**

UHS 2025

One apple pie has 10 slices, and each apple pie feeds five people. Henry is having a party with 200 people. How many slices of pie does he need?

- (A) 200
- (B) 50
- (C) 400
- (D) 100

**Q7.**

UHS 2025

How many trees are in the orchard?

Which of the statements below are needed to sufficiently answer this question?

i. Ibrahim is a farmer and looks after half of the trees in the orchard.

ii. 300 trees in the orchard are under Ibrahim's care.

- (A) i is enough
- (B) ii is enough
- (C) both i and ii are needed
- (D) neither i nor ii are sufficient

**Q8.**

UHS 2025

Asad bought 50 packets of biscuits for the price of Rs. 500; whereas Anum bought 25 packets of chips for the price of Rs. 1000. While comparing the prices of packets of biscuits and chips, which of the following statements is correct?

- (A) Price of 4 packets of biscuits is equal to the price of 1 packet of chips
- (B) Price of 1 packet of biscuits is equal to the price of 4 packets of chips
- (C) Price of 2 packets of biscuits is equal to the price of 1 packet of chips
- (D) Price of 1 packet of biscuits is equal to the price of 2 packets of chips

**Q9.**

DUHS 2025

A tank can hold 240 L of water. Currently, water is filled to one-third of its capacity.

How much more water can it hold?

- (A) 60 L
- (B) 80 L
- (C) 160 L
- (D) 100 L

**Q10.**

BUMHS 2025

If a person earns Rs. 1000 in the first week and their income doubles each week, how much will they earn in the 4th week?

- (A) Rs. 4000
- (B) Rs. 8000
- (C) Rs. 3000
- (D) Rs. 16000

**Q11.**

BUMHS 2025

In a certain university, 25% candidates failed university admission test. Of those who passed the test, 80% got the admission in the university. If 1800 got admission, how many candidates appeared in the test?

- (A) 9000
- (B) 6000
- (C) 3000
- (D) 5000

**Q12.**

DUHS 2025

A tank can hold 240 L of water. Currently, water is filled to one-third of its capacity. How much more water can it hold?

- (A) 60 L
- (B) 80 L
- (C) 100 L
- (D) 160 L

**Q13.**

KMU 2025

A medication dose starts at 100mg and halves each day. What will be the dose on day 4?

- (A) 12.5 mg
- (B) 25 mg
- (C) 30 mg
- (D) 50 mg

**Q14.**

KMU 2025

A library has 4 books on Shelf A and 8 books on Shelf B. Some books are removed from Shelf B such that both shelves now have exactly the same number of books. How many books were removed from Shelf B?

- (A) 2 books
- (B) 3 books
- (C) 4 books
- (D) 6 books

**Q15.**

KMU 2025

If 5 boxes of soap weigh 75 kilos and each box when empty weighs 3 kilos. What is total weight of the soaps?

- (A) 15
- (B) 30
- (C) 45
- (D) 60

**Q16.**

UHS 2025

One apple pie has 10 slices, and each apple pie feeds five people. Henry is having a party with 200 people. How many slices of pie does he need?

- (A) 200
- (B) 50
- (C) 400
- (D) 100

**Q17.**

UHS 2025

How many trees are in the orchard?

Which of the statements below are needed to sufficiently answer this question:

- i. Ibrahim is a farmer and looks after half of the trees in the orchard
- ii. 300 trees in the orchard are under Ibrahim's care

- (A) i is enough
- (B) ii is enough
- (C) both i and ii are needed
- (D) neither i or ii are sufficient

**Q18.**

UHS 2025

Asad bought 50 packets of biscuits for the price of Rs. 500; whereas Anum bought 25 packets of chips for the price of Rs.1000. While comparing the prices of packets of biscuits and packet of chips, which of the following statements is correct?

- (A) Price of 4 packets of biscuits is equal to the price of 1 packet of chips
- (B) Price of 1 packet of biscuits is equal to the price of 4 packets of chips
- (C) Price of 2 packets of biscuits is equal to the price of 1 packet of chips
- (D) Price of 1 packet of biscuits is equal to the price of 2 packets of chips

**Q19.**

KMU 2024

A store offers a 10% discount on all items. After applying the discount, the price of an item is Rs. 450. What was the original price of the item?

- (A) Rs. 490
- (B) Rs. 495
- (C) Rs. 500
- (D) Rs. 505

RAPID 5–COLUMN ANSWER KEY

Official PMDC verified answer keys for 10. Percentages, Ratios & Unit Calculations.

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| Q# | KEY | BOARD      | Q# | KEY | BOARD    | Q# | KEY | BOARD      | Q# | KEY | BOARD    | Q# | KEY | BOARD    |
|----|-----|------------|----|-----|----------|----|-----|------------|----|-----|----------|----|-----|----------|
| 1  | D   | BUMHS 2025 | 5  | C   | KMU 2025 | 9  | C   | DUHS 2025  | 13 | A   | KMU 2025 | 17 | C   | UHS 2025 |
| 2  | C   | BUMHS 2025 | 6  | C   | UHS 2025 | 10 | B   | BUMHS 2025 | 14 | C   | KMU 2025 | 18 | A   | UHS 2025 |
| 3  | A   | KMU 2025   | 7  | C   | UHS 2025 | 11 | C   | BUMHS 2025 | 15 | D   | KMU 2025 | 19 | C   | KMU 2024 |
| 4  | A   | KMU 2025   | 8  | A   | UHS 2025 | 12 | D   | DUHS 2025  | 16 | C   | UHS 2025 |    |     |          |

TOTAL MCQS  
19

CORRECT  
-----

INCORRECT  
-----

BLANK  
-----

ACCURACY  
-----  
%

Scan the booklet QR code to enter answers in **BeambePrep Grind Mode** for automated error autopsies.

## PROPOLIS COGNITIVE ERROR AUTOPSIES

Step-by-step conceptual derivations, formula working, and distractor autopsies for every question.

### Question #1 Key: (D)

BUMHS 2025

If a person earns Rs. 1000 in the first week and their income doubles each week, how much will they earn in th...

#### CORE CONCEPT AND DERIVATION

Geometric Progression.

**Formula:**  $T_n = a \times r^{(n-1)}$

**Solution:**

- Week 1 ( $a$ ) = Rs. 1000
- Week 2 =  $1000 \times 2 = \text{Rs. } 2000$
- Week 3 =  $2000 \times 2 = \text{Rs. } 4000$
- Week 4 =  $4000 \times 2 = \text{Rs. } 8000$

**Why other options are incorrect:**

- **Option A:** Incorrectly calculates for the 3rd week.
- **Option C:** Incorrectly calculates for the 5th week.

### Question #2 Key: (C)

BUMHS 2025

In a certain university, 25% candidates failed university admission test. Of those who passed the test, 80% go...

#### CORE CONCEPT AND DERIVATION

Percentage Word Problems.

**Formula:**  $\text{Admitted} = X \times (1 - \text{Failed}\%) \times \text{Passed Admitted}\%$

**Solution:**

- Let total candidates =  $X$ .
- Passed fraction =  $100\% - 25\% = 75\% = 0.75$ .
- Admitted fraction =  $80\% \text{ of } 0.75X = 0.80 \times 0.75X = 0.60X$ .
- Set equal to given count:  $0.60X = 1800 \implies X = \frac{1800}{0.60} = 3000$ .

**Why other options are incorrect:**

- **Options A, B, and D:** Result from misinterpreting percentages or dividing by wrong factors.

### Question #3 Key: (A)

KMU 2025

If five boxes of soap weigh 75 kilos and each box when empty weighs three kilos. What is the total weight of t...

#### CORE CONCEPT AND DERIVATION

Quantitative Net Weight Problems.

**Formula:**  $\text{Net Soap Weight} = \text{Gross Weight} - (\text{Number of Boxes} \times \text{Empty Weight per Box})$

**Solution:**

- Empty box weight =  $5 \times 3 \text{ kg} = 15 \text{ kg}$ .
- Soap weight =  $75 \text{ kg} - 15 \text{ kg} = 60 \text{ kg}$ .

**Why other options are incorrect:**

- **Option B:** Is the weight of the empty boxes alone.
- **Option D:** Incorrectly calculates box weight as 6 kg each.

**Question #4** Key: (A)

KMU 2025

A medication dose starts at 100mg and halves each day. What will be the dose on day 4?

**CORE CONCEPT AND DERIVATION**

Half-life Decay.

**Formula:**  $A = A_0 \times \left(\frac{1}{2}\right)^t$

**Solution:**

- Day 1 = 100 mg
- Day 2 = 50 mg
- Day 3 = 25 mg
- Day 4 = 12.5 mg

**Why other options are incorrect:**

- **Option B:** Calculates dose for Day 3.

**Question #5** Key: (C)

KMU 2025

A library has four books on shelf A, 8 books on shelf B. Some books are removed from shelf B such that both sh...

**CORE CONCEPT AND DERIVATION**

Quantitative Equalities.

**Formula:** Removed = Initial Shelf B – Target Shelf A

**Solution:**

- Removed = 8 – 4 = 4 books.

**Why other options are incorrect:**

- **Option A:** Calculates the difference needed if books were transferred rather than simply removed.

**Question #6** Key: (C)

UHS 2025

One apple pie has 10 slices, and each apple pie feeds five people. Henry is having a party with 200 people. Ho...

**CORE CONCEPT AND DERIVATION**

Proportional Ratios.

**Formula:** Slices =  $\left(\frac{\text{People}}{\text{People per pie}}\right) \times \text{Slices per pie}$

**Solution:**

- Pies needed =  $\frac{200}{5} = 40$  pies.
- Total slices = 40 × 10 = 400 slices.

**Why other options are incorrect:**

- **Option A:** Incorrectly assumes 1 slice per person.

**Question #7** Key: (C)

UHS 2025

How many trees are in the orchard? Which of the statements below are needed to sufficiently answer this questi...

**CORE CONCEPT AND DERIVATION**

Data Sufficiency.

**Formula:** Total =  $\frac{\text{Known Count}}{\text{Fraction}}$

**Solution:**

- Statement (i) gives the fraction (1/2).
- Statement (ii) gives the exact count (300).
- Combined: Total =  $\frac{300}{0.5} = 600$  trees. Both statements are necessary.

**Why other options are incorrect:**

- **Options A and B:** Neither statement alone provides both fraction and absolute number.

**Question #8** Key: (A)

UHS 2025

Asad bought 50 packets of biscuits for the price of Rs. 500; whereas Anum bought 25 packets of chips for the p...

**CORE CONCEPT AND DERIVATION**

Unit Cost Comparison.

**Formula:** Unit Price =  $\frac{\text{Total Cost}}{\text{Quantity}}$

**Solution:**

- 1 biscuit pack =  $\frac{500}{50} = \text{Rs. } 10$ .
- 1 chips pack =  $\frac{1000}{25} = \text{Rs. } 40$ .
- $4 \times 10 = 40 \implies$  Price of 4 biscuit packs = Price of 1 chips pack.

**Why other options are incorrect:**

- **Option B:** Inverts the relationship ratio.

**Question #9** Key: (C)

DUHS 2025

A tank can hold 240 L of water. Currently, water is filled to one-third of its capacity. How much more water c...

**CORE CONCEPT AND DERIVATION**

Fractional Capacity Calculations.

**Formula:** Remaining Volume =  $V_{\text{total}} \times \left(1 - \frac{1}{3}\right) = V_{\text{total}} \times \frac{2}{3}$

**Solution:**

- Filled volume =  $240 \times \frac{1}{3} = 80 \text{ L}$ .
- Remaining capacity =  $240 - 80 = 160 \text{ L}$ .

**Why other options are incorrect:**

- **Option B:** Is the volume currently filled, not the remaining capacity.

**Question #10** Key: (B)

BUMHS 2025

If a person earns Rs. 1000 in the first week and their income doubles each week, how much will they earn in th...

**CORE CONCEPT AND DERIVATION**

Doubling Progression.

**Formula:**  $a_n = a_1 \times 2^{n-1}$

**Solution:**

- Week 1 = Rs. 1000
- Week 4 =  $1000 \times 2^3 = 1000 \times 8 = \text{Rs. } 8000$ .

**Why other options are incorrect:**

- **Option D:** Calculates Week 5 earnings.

**Question #11** Key: (C)

BUMHS 2025

In a certain university, 25% candidates failed university admission test. Of those who passed the test, 80% go...

**CORE CONCEPT AND DERIVATION**

Sequential Percentages.

**Formula:**  $0.80 \times 0.75 \times X = 1800$

**Solution:**

- $0.60X = 1800 \implies X = 3000$ .

**Why other options are incorrect:**

- **Option B:** Divides by 0.30 instead of 0.60.

**Question #12** Key: (D)

DUHS 2025

A tank can hold 240 L of water. Currently, water is filled to one-third of its capacity. How much more water c...

**CORE CONCEPT AND DERIVATION**

Subtraction of Volume.

**Formula:**  $240 - \left(\frac{240}{3}\right) = 160 \text{ L}$

**Solution:**  $240 - 80 = 160 \text{ L}$ .

**Why other options are incorrect:**

- **Option B:** Represents filled water.

**Question #13** Key: (A)

KMU 2025

A medication dose starts at 100mg and halves each day. What will be the dose on day 4?

**CORE CONCEPT AND DERIVATION**

Half-Life Decay.

**Formula:**  $100 \times \left(\frac{1}{2}\right)^3 = 12.5 \text{ mg}$

**Solution:** Day 1: 100, Day 2: 50, Day 3: 25, Day 4: 12.5 mg.

**Why other options are incorrect:**

- **Option B:** Dose on Day 3.

**Question #14** Key: (C)

KMU 2025

A library has 4 books on Shelf A and 8 books on Shelf B. Some books are removed from Shelf B such that both sh...

**CORE CONCEPT AND DERIVATION**

Direct Subtraction.

**Formula:**  $8 - X = 4 \implies X = 4$

**Solution:** Removing 4 books leaves 4 books on Shelf B.

**Why other options are incorrect:**

- **Option A:** Leaves 6 books.

**Question #15** Key: (D)

KMU 2025

If 5 boxes of soap weigh 75 kilos and each box when empty weighs 3 kilos. What is total weight of the soaps?

**CORE CONCEPT AND DERIVATION**

Net Weight Computation.

**Formula:**  $75 - (5 \times 3) = 60 \text{ kg}$

**Solution:** Gross weight (75) minus box weight (15) = 60 kg.

**Why other options are incorrect:**

- **Option A:** Weight of empty boxes.

**Question #16** Key: (C)

UHS 2025

One apple pie has 10 slices, and each apple pie feeds five people. Henry is having a party with 200 people. Ho...

**CORE CONCEPT AND DERIVATION**

Proportional Calculations.

**Formula:**  $\left(\frac{200}{5}\right) \times 10 = 400$

**Solution:** 40 pies  $\times$  10 slices = 400 slices.

**Why other options are incorrect:**

- **Option A:** Assumes 1 slice per person.

**Question #17** Key: (C)

UHS 2025

How many trees are in the orchard? Which of the statements below are needed to sufficiently answer this questi...

**CORE CONCEPT AND DERIVATION**

Data Sufficiency Logic.

**Formula:** Total =  $\frac{300}{0.5} = 600$

**Solution:** Fraction (i) and count (ii) together yield the total count.

**Why other options are incorrect:**

- **Options A and B:** Incomplete data individually.

**Question #18** Key: (A)

UHS 2025

Asad bought 50 packets of biscuits for the price of Rs. 500; whereas Anum bought 25 packets of chips for the p...

**CORE CONCEPT AND DERIVATION**

Ratio and Unit Price.

**Formula:**  $4 \times 10 = 40$

**Solution:** Biscuit pack = Rs. 10, Chips pack = Rs. 40. Thus, 4 biscuit packs equal 1 chips pack.

**Why other options are incorrect:**

- **Option B:** Reverses the pricing.

**Question #19** Key: (C)

KMU 2024

A store offers a 10% discount on all items. After applying the discount, the price of an item is Rs. 450. What...

**CORE CONCEPT AND DERIVATION**

Reverse Percentage Discount Calculation.

**Formula:** Original Price =  $\frac{\text{Discounted Price}}{1-d}$

**Solution:**

•  $0.90 \times P_{\text{orig}} = 450 \implies P_{\text{orig}} = \frac{450}{0.90} = \text{Rs. } 500.$

**Why other options are incorrect:**

- **Option B:** Simply adds 10% of 450 (45) to get 495, which is mathematically incorrect.